REMARKS

This application has been carefully reviewed in light of the Office Action dated April 17, 2008. Claims 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18 and 25 to 27 remain pending in the application, of which Claims 1, 4, 7, 10, 13, 16 and 25 to 27 are independent. Reconsideration and further examination are respectfully requested.

Claims 1, 3, 4, 6, 25, 26 and 27 were rejected under 35 U.S.C. § 112, second paragraph, for the claims allegedly invoking § 112, sixth paragraph, and for the specification allegedly not providing a description of sufficient structure to define each of the claimed means elements. Without conceding the correctness of the rejections, the claims at issue have been amended so as to not invoke § 112, sixth paragraph. In addition, it is submitted that each of the claimed units is fully supported by the specification in that, at the very least, the unit can be seen to correspond to a computer process that is executed by the memory and processor of each apparatus. Thus, reconsideration and withdrawal of the § 112, second paragraph rejections are respectfully requested.

Claims 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16 and 18 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,813,043 (Mizuyama) in view of U.S. Patent No. 6,917,446 (Tanaka) and further in view of U.S. Patent No. 7,099,045 (Nabeshima), and Claims 25, 26 and 27 were rejected under § 103(a) over Mizuyama in view of U.S. Patent No. 6,068,361 (Mantell) and further in view of Nabeshima. Reconsideration and withdrawal of the rejections are respectfully requested.

The present invention concerns error diffusion processing on colors of different densities. According to the invention, one of two different types of error diffusion processes are executed for similar color components, where a first error diffusion process is

executed to the density component whose highest density which can be expressed is low, and a second error diffusion process is executed to the density component whose highest density which can be expressed is high. For example, the present invention takes the gradation depicted in Fig. 3 into consideration, where the density when the use of cyan ink of a large liquid droplet is started is equal to a value near the halftone of an original image in which sufficient cyan ink of a small liquid droplet has already existed (specification page 19, lines 10-16). In view of the gradation expressing, with respect to the density component whose highest density which can be expressed is high (i.e., for cyan ink of large liquid droplet), the error diffusion processing control unit of the present invention executes the error diffusion process by the second processing unit, which requires a lighter processing load than that by the first processing unit.

Referring specifically to the claims, Claim 1 is directed to an image processing apparatus for executing an error diffusion process to a plurality of density components, comprising a processor and a memory, a first processing unit that executes the error diffusion process by changing at least one of a quantization threshold value and a quantization diffusion coefficient which are used for the error diffusion process on the basis of information on one of the density components to be processed, a second processing unit that executes the error diffusion process by setting, into fixed values, the quantization threshold value and the quantization diffusion coefficient which are used for the error diffusion process, wherein the error diffusion process by the second processing unit requires a lighter processing load than the error diffusion process by the first processing unit; and an error diffusion processing control unit that controls to execute, by the first processing unit, the error diffusion process to density components of a similar color among

the plurality of density components by executing the error diffusion process to the density component whose highest density which can be expressed is low, and executing, by the second processing unit, the error diffusion process to the density component whose highest density which can be expressed is high.

Claim 4 substantially corresponds to Claim 1, but is more specifically directed to a print control apparatus rather than an image processing apparatus. Claims 7 and 10 are method claims that substantially correspond to Claims 1 and 4, respectively, while Claims 13 and 16 are computer medium claims that substantially correspond to Claims 1 and 4, respectively.

Claim 25 is a variation of Claim 1 that is directed to an image processing apparatus for executing an error diffusion process to a plurality of density components, comprising a processor and a memory, a first processing unit that executes the error diffusion process by changing at least one of a quantization threshold value and a quantization diffusion coefficient which are used for the error diffusion process on the basis of information on one of the density components to be processed, a second processing unit that executes the error diffusion process by setting, into fixed values, the quantization threshold value and the quantization diffusion coefficient which are used for the error diffusion process, wherein the error diffusion process by the second processing unit requires a lighter processing load than the error diffusion process by the first processing unit, and an error diffusion processing control unit that controls to execute the error diffusion process of the density components of a similar color among the plurality of density components by executing, by the first processing unit, the error diffusion process to

the density component whose droplet is small, and executing, by the second processing unit, the error diffusion process to the density component whose droplet is large.

Claims 26 and 27 are method and computer medium claims, respectively, that substantially correspond to Claim 25.

The applied art, alone or in any permissible combination, is not seen to teach the features of the invention, and in particular, with regard to Claims 1, 4, 7, 10, 13 and 16, is not seen to teach at least the features of, an error diffusion processing control unit/step that controls to execute, by a first processing unit/step, an error diffusion process to density components of a similar color among a plurality of density components by executing the error diffusion process to the density component whose highest density which can be expressed is low, and executing, by a second processing unit/step, the error diffusion process to the density component whose highest density which can be expressed is high, where the error diffusion process by the second processing means/step requires a lighter processing load than the error diffusion process by the first processing unit/step.

Similarly, with regard to Claims 25 to 27, the applied art is not seen to disclose or to suggest at least the features of an error diffusion processing control unit/step that controls to execute the error diffusion process of the density components of a similar color among the plurality of density components by executing, by the first processing unit, the error diffusion process to the density component whose droplet is small, and executing, by the second processing unit, the error diffusion process to the density component whose droplet is large, where the error diffusion process by the second processing means/step requires a lighter processing load than the error diffusion process by the first processing unit/step.

Mizuyama is seen to disclose data for a target pixel having been subjected to quasi-greyscale processing is input and the density is evaluated to determine if it exceeds a threshold for each hue channel. If the density exceeds the threshold for at least a predetermined number of channels, the density of at least one channel is adjusted with a lower density. Mizuyama is not, however, seen to teach the foregoing features of Claims 1, 4, 7, 10, 13, 16 and 25 to 27 and the Office Action admits as much.

Tanaka is not seen to make up for the deficiencies of Mizuyama. In this regard, Tanaka is merely seen to employ a two-level quantization process. However, Tanaka is not seen to teach anything that, when added to Mizuyama, would have resulted in the features of, an error diffusion processing control unit/step that controls to execute, by a first processing unit/step, an error diffusion process to density components of a similar color among a plurality of density components by executing the error diffusion process to the density component whose highest density which can be expressed is low, and executing, by a second processing unit/step, the error diffusion process to the density component whose highest density which can be expressed is high, where the error diffusion process by the second processing means/step requires a lighter processing load than the error diffusion process by the first processing unit/step (Claims 1, 4, 7, 10, 13 and 16), or at least the features of, an error diffusion processing control unit/step that controls to execute the error diffusion process of the density components of a similar color among the plurality of density components by executing, by the first processing unit, the error diffusion process to the density component whose droplet is small, and executing, by the second processing unit, the error diffusion process to the density component whose droplet is large, where the

error diffusion process by the second processing means/step requires a lighter processing load than the error diffusion process by the first processing unit/step (Claims 25 to 27).

Nabeshima is also not seen to make up for the deficiencies of Mizuyama and Tanaka. In this regard, Nabeshima is seen to disclose a system that judges when characters are present on halftone areas and for distinguishing between the two. However, Nabeshima is not seen to disclose or to suggest anything that, when combined with Mizuyama and/or Tanaka, would have resulted in the features of, an error diffusion processing control unit/step that controls to execute, by a first processing unit/step, an error diffusion process to density components of a similar color among a plurality of density components by executing the error diffusion process to the density component whose highest density which can be expressed is low, and executing, by a second processing unit/step, the error diffusion process to the density component whose highest density which can be expressed is high, where the error diffusion process by the second processing means/step requires a lighter processing load than the error diffusion process by the first processing unit/step (Claims 1, 4, 7, 10, 13 and 16), or at least the features of, an error diffusion processing control unit/step that controls to execute the error diffusion process of the density components of a similar color among the plurality of density components by executing, by the first processing unit, the error diffusion process to the density component whose droplet is small, and executing, by the second processing unit, the error diffusion process to the density component whose droplet is large, where the error diffusion process by the second processing means/step requires a lighter processing load than the error diffusion process by the first processing unit/step (Claims 25 to 27).

Mantell has been studied but it is not seen to disclose or to suggest anything that makes up for the deficiencies of Mizuyama, Tanaka, and Nabeshima.

In view of the foregoing amendments and remarks, independent Claims 1, 4, 7, 10, 13, 16 and 25 to 27, as well as the claims dependent therefrom, are believed to be allowable.

No other matters having been raised, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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